

ITEMS OF INTEREST.

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Shots from the Profession.

PROCEEDINGS OF THE PENNSYLVANIA STATE DENTAL SOCIETY.

Reported by Dr. Wm. H. Trueman for the ITEMS OF INTEREST.

[Continued from page 515.]

DENTAL DIAGNOSIS.

Dr. Charles J. Essig, of Philadelphia, read a paper upon Dental Diagnosis. He remarked: Pain or discomfort in or around a tooth while usually the first symptom of a deviation from the normal condition, either of the pulp or the surrounding tissues, may be merely sympathetic, and the organ seemingly effected, perfectly sound. The differential diagnosis of the cause of the trouble, therefore, often demands much care and intelligence.

The causes of pain in and around the dental organs at present recognized are comparatively numerous, but are often so obscure as to baffle for a time all efforts to find their origin. Even in the apparently simple matter of differentiating between the pain of pericoronitis, and the purely neuralgic pain of an exposed pulp, much difficulty may occasionally be experienced.

This was illustrated in a recent case. The patient complained of great pain in an upper tooth on the right side which she could not definitely locate. Placing her finger on the first molar she remarked, "it begins here and extends toward the temple." On examining the tooth in question, I found it devitalized, and the cavities in it filled with gold after the most approved contour methods, as were several of the other teeth near to it. The work was beautifully done, and suggested that the roots had been properly treated. There were marks on the gum over the tooth indicating the previous existence of an abscess, but at the time of examination there was not the least tenderness on percussion, and no loosening or elongation. In response to questions the patient said that neither heat nor cold aggravated the pain, but the recumbent position made it much worse. The fact of

this tooth being devitalized—the evidence of previous trouble—and the statement of the patient that the recumbent position made the face throb, induced me in the hurry of the moment to treat it as a case of incipient pereostetis. She reported the next morning unrelieved.

I now made a more thorough examination, determined to find the cause of pain, and asked the following questions; the answers will suggest to you how little we can depend upon the patients observations in many of these cases. My first question was. Does the pain come on after eating? No, it may come at anytime. Does sweet cause it? No. The recumbent position aggravates it? Yes, I could not lie down at all last night. Are you sure cold does not cause it? Yes, I have just eaten water-ice without any discomfort. In order to test this, I took up a syringe and threw a jet of not very cold water equally upon the first molar, and the second bicuspid. Instantly the patient suffered the most acute pain. Here then was the trouble. The second bicuspid contained a very large gold contour filling. The absence of redness—swelling, loosening, and elongation—indicates that the pain was confined to the pulp only. The filling was removed—it had been very securely anchored by a number of retaining pits, one of which penetrated to the pulp. A fine exploring instrument was passed into it, and on its removal a small amount of pus came out followed by bleeding.

Even in simple cases, where the patient can definitely indicate the effected tooth, diagnostic care is still necessary to successful treatment, particularly where the previous history of the tooth is unknown. This may be illustrated by another case.

The tooth, a first superior molar had been exceedingly painful for two days, it was sufficiently raised from its socket to prevent contact with the other teeth, and was slightly tilted toward the cheek, which assured me the trouble was at the usual place, the palatine root. The tooth contained a large gold filling. I drilled through this toward the root in fault—found this well filled with oxychloride cement. With much labor I removed this and reached the apical foramen. Pus followed the removal of the drill, and after that quite a free flow of blood. Relief soon followed—although not unfrequently the pain is intensified for a short time after the sudden termination of the pressure. The point of diagnostic value in this case was, first; The direction in which the tooth was tilted—indicating the exact seat of the lesion. Second; The slight elastic movement of the tooth when pressed, showing the presence of pus.

We may also meet with complications of a much more puzzling character than those here described. Recently such a case presented. The mouth had received no attention for ten years. There was great

pain in the left inferior second or third molar. It required no little care to arrive at the conclusion that the pulp in the wisdom tooth was slightly exposed and fully alive, and that the pulp in the second molar had long been dead, and that the violet colored nodule which was easily seen projecting through an opening from the pulp chamber was gum tissue, and not the pulp. It may be remarked that the difference in sensation between the two might have settled the question, but so far as response to contact of the instrument went, the patient did not seem able to distinguish between them. It is needless to say that the hasty or careless use of arsenic at the time of the first examination might have been serious. Another case, even more forcible, illustrates the difficulty of diagnosis. The patient suffered from severe pain, swelling, and elongation of the inferior first molar, and a small circumscribed abscess on the right superior canine. Neither of the teeth had ever been decayed, but both were effected by pyorrhœa alveolaris. Aware that small circumscribed abscesses often occur during the progress of that disease without the pulp being involved; and that the sineous, or pocket, which forms along the tooth, may, by its encroachment, cause the death of the pulp, and the usual more diffused abscess, the important point to determine was, which condition had we to deal with, as the treatment would depend entirely on the condition found. According to the patient's account, the molar had been sensitive to cold a long time and had been so tender that it was practically useless. The canine had never given any trouble. I inferred, that the pulp of the molar had died, and we had the usual form of alveolar abscess to deal with; and that the canine was merely effected by one of the usual characteristics of pyorrhea alveolaris. Application of ice cold water confirmed the diagnosis. In the case of the molar, an opening was made into the pulp chamber; the abscess over the canine was opened and treated with chloride of zinc. The relief in each case was prompt and permanent.

It may be urged, that the cases cited are somewhat unusual. Let us grant at once that such is the case—I hold that it is in just such cases that difficulty, if not danger, is to be encountered,—and therefore unusual cases demand extraordinary care.

Dr. William H. Trueman, of Philadelphia, was very much interested in Dr. Essig's paper; he remarked: We are constantly meeting with cases like those just cited, cases where the diagnosis is alike very difficult, and very important. The third case mentioned by Dr. Essig was especially so; and how easy, how very easy, in such a case, to make a mistake without being at all careless; and, under some circumstances, such a mistake, as the Doctor remarks, might be very serious.

It seems very easy to diagnose a devitalized tooth from a vital

one,—and yet, there are many cases where he was unable to do so at the first examination—indeed, in some cases, as occurred some years ago with a tooth in our own mouth, it is almost impossible without actually opening into the tooth. The tooth referred to was repeatedly examined by several dentists of large experience, who were unable to decide as to its condition. About twelve years after, it was opened into and found to be dead, probably had been so a long time, yet had never given any trouble or shown the least sign of its true condition.

We are aware of the usual means of testing, and of the usual signs of death of the pulp ; but we occasionally meet with cases where all signs and tests leave us in doubt. If we drill into the pulp supposing it dead, and find it alive, we have done irreparable injury. We would very much like to know how we can absolutely diagnose whether the pulp is dead or alive in these unusual cases.

Then, we meet with other cases of difficult diagnosis—none more so perhaps, than those where bony granules—pulp-stones, they are sometimes termed—are found in the pulp chamber. They may, and often do, cause intense pain, without the pain being localized sufficiently, or causing any other symptom of trouble to enable us to detect the tooth in fault. Indeed, there may be more than one tooth in the same condition. At one time the pain may settle in a certain tooth, in a few hours it has passed from that and is felt in another, or the pain may be so diffused and general that the patient cannot locate it at all. We had such a case sometime ago. It was only after repeated examinations that a lower molar gave a suspicion of tenderness on percussion ; the case then passed to another dentist who found the same tooth very slightly sensitive and drilled into and devitalized it. Granules of bone were found in the pulp. The tooth was treated and filled with every possible care, yet, a year after, the patient complained that it was so sore and painful during mastication that he seriously contemplated having it extracted. This is too often the history of such cases, before it is possible to locate the seat of injury, the irritation has continued so long, or has been so severe, that we really have a neuralgic trouble very hard to subdue, unless the tooth is extracted.

We may also refer to the trouble we have from nerve sympathy ; for instance, an exposed pulp in the lower jaw giving rise to pain in an upper tooth, etc., the tooth really in fault giving no sign. This was illustrated in a recent case ; severe pain in a lower first bicuspid slightly decayed, was really due to an exposed pulp in the lower third molar of the same side. It was very hard to convince the patient that a tooth he had never felt—was not conscious of being at all sensitive, was probably responsible for the pain he suffered ; yet its removal gave immediate relief. We might multiply these cases. Then we may

have an abscess appearing far distant from the tooth causing it; or periosteal irritation entirely due to mal-occlusion, when we would least look for it; or dental trouble due entirely to nerve sympathy, the real irritation being far removed from the dental organs; and many other unusual cases which your experience will suggest. True they *are* unusual—some of them very unusual cases—but, as Dr. Essig well says, they are cases requiring extreme care to accurately diagnose, and in which accurate diagnosis is very important.

The question was raised, whether it was possible to have an alveolar abscess on a tooth with a living pulp. Dr. Darby related a case of abscess where he had no doubt the pulp was alive. Dr. Gerhart, also, stated that he met with a case where two living teeth were abscessed. Dr. Green stated in 1848 he met with a canine discharging freely, apparently abscessed, but afterwards found the puss came from the antrum. He considered nodularly dentine the most difficult to diagnose of any condition we have to treat, and questioned whether it was not better to extract at once. It was so often associated with a neuralgic condition, that the chance of making the tooth permanently comfortable seemed very slight.

Dr. Darby related a case of a maiden lady about forty-five years of age, who had consulted him complaining of severe pain in the teeth. He had examined them several times and found nothing wrong. Five or six others had also examined the mouth with the same result. She had also consulted a number of physicians, and had been under their treatment without relief. The last time she was in his office he found that all the teeth had been extracted, but the pain still continued. In consultation with her physician they both agreed that the trouble was due to uterine irritation, perhaps aggravated by dyspepsia, from which she had long suffered.

Dr. Gerhart suggested that catarrh—which he considered an American disease—was, in many difficult cases, the real cause of trouble. The irritation associated with it had no doubt, through nerve sympathy, at times, caused severe pain in and around the teeth.

Dr. C. S. Beck, said, that in diagnosing obscure cases we must look beyond the point where pain is felt. We must consider the patient, the time of life, the condition of life, and social surroundings. Those who are reared in luxury, and indulge in high living, and make but little exertion; who really are not filling the part in life nature designed they should, we will generally find suffer more intensely from nerve troubles. It seems to be nature's way of evening things up.

Dr. Guilford called attention to a small electric light recently introduced, which seemed to be entirely practical for use in the mouth, and promised to be a valuable aid in minute examinations of the teeth.

When held behind the teeth it seemed to make the parts transparent, and the condition of the pulp was very plainly shown. If alive, it could not be seen, if congested, a change of color would be noticed, while a dead pulp seemed quite opaque; so plain is this seen, that where the canal is filled, a black line is seen as far as the filling extends. By this arrangement we are able to see the exact condition of the root with certainty. He thought it would prove valuable also in detecting incipient decay on the approximal surfaces.

[To be continued.]

ABSORPTION OF TEMPORARY TEETH.

PROF. W. E. EAMES, D. D. S., ST. LOUIS, MO.

[Part of Paper read before the Illinois Society.]

It is stated that the method employed by nature for the removal of the temporary teeth is *sui-generis*. We must dissent from this view, believing it to be the same process that she has provided for the removal of other tissues. The removal of the protruding stump of a limb, by the granulating cells, after the sloughing off of the soft parts, is identical in form and results, with the removal of the temporary teeth. It is simply a result following one of the phases of inflammation; the result of an excitation in a part, otherwise normal, inducing a proliferation of cell growth, which may be progressive or retrogressive in character, or both interchangeably; at one time acting as an absorbing organ, and at another as a builder up of tissue, dependent, as is generally supposed, on the amount of life-force present.

Let us apply this view of the character and action of the so-called absorbent organ to the removal of the roots of the temporary teeth. When the crown of a permanent tooth is completed and the growth of the tooth commences (if the process goes on normally), the growth of the root forces the crown onward against the hard tissue, covering it with force sufficient to produce excitation and promote the proliferation of cell growth in the part; and these cells, so far as we are able to learn, are identical in character with those found in a granulated wound and produced under similar conditions, the same as are produced in cases of inflammation of a low type, which result in destruction of tissue.

Here then we find the development of the absorbent cells in the part ready to remove any obstruction to the continued growth of the permanent tooth. Thus is the crypt of the permanent tooth, the alveolus, and roots of the temporary tooth, removed. It frequently happens that the partial removal of a temporary root is sufficient to relieve the pressure produced by the incoming tooth, changing the cells, proliferated from a retrogressive to a progressive character; and

the process of building up of tissue succeeds—and this again may be succeeded by absorption.

It is a noticeable fact that the roots of replanted teeth are frequently removed by a process identical, in all respects, to the removal of the temporary teeth. This occurs, in some cases, soon after the operation of replantation; in other cases several years may elapse before the tooth is lost. Sometimes this work of removal commences at the apex of the root, at other times it will be noticed at the gingival border.

The removal, by nature, of the roots of replanted teeth is termed a pathological process; and yet wherein does it differ from the removal of the roots of the temporary teeth, which is recognized as a physiological process? It is, undoubtedly, one and the same process, dependent on the same causes for its action, and governed and controlled by the same laws. The conditions in the case of a replanted tooth are eminently fitted to induce this change, causing a proliferation of cell growth; the circulation in the parts surrounding the root being defective, a low type of inflammation is readily set up, and the development of cells of a retrogressive character may reasonably be looked for, sooner or later, in every case.

Just how these cells do their work is as yet an unsettled question; most writers inclining to the opinion that a fluid of exudation is present which dissolves out the lime-salts from the hard tissues with which it comes in contact. The following brief extract, from a lecture by Dr. G. V. Black, Jacksonville, Ill., on "Ferments," is the best explanation of the action of the absorbent organ, and is, in my opinion, in advance of anything which has been written on this subject:—"Absorptive and resorptive digestion is accomplished by a soluble ferment, elaborated by the tissues under special circumstances, for the removal of tissues no longer needed, as roots of temporary teeth. The absorption of the temporary teeth is a physiological process, as all other absorptive processes are. It is brought about by the action of a class of cells which have become known as 'osteo' or 'odontoclasts'. These are only the ordinary connective tissue cells of the part in immediate proximity with the part to be removed, which have temporarily taken on new functions—the secretion or elaboration of a soluble ferment for the removal of these roots of the temporary teeth which are no longer wanted. These cells perform this act in an indirect manner. It is plain that these roots are not removed by any mere mechanical force. These cells have no physical power of growing into them; they secrete a soluble ferment, analogous to the body which digests them, breaks them down and fits their substance for entering into the blood streams by osmosis, just as solid ingesta in the stomach is broken down and *fitted* to enter the circulation by osmosis.

"There seems to be no foundation for the notion that the resorption of these roots may not form proper pabulum for the building up of other tissues. The absorbed product is not necessarily excreted. From accident or decay the temporary teeth often lose their pulps, which sometimes results in the formation of an alveolar abscess. If such an abscess exists at the time absorption should take place, absorption fails, partially or entirely; the tissue which performs this function being thrown into a pathological state or condition, the secretion of the soluble ferment does not take place in the usual manner.

"If, however, the abscess does not occur, or if such abscess be cured, and the tissues in immediate proximity to the devitalized root be perfectly healthy, it is found that the absorption goes on in the usual manner. The mere death of the root does not interfere with the resorption, provided the physiological condition is maintained in the immediately surrounding cells, which are the active agents in the work. The soluble ferment does not depend for its action upon the life of the tissue to be acted upon. The roots are simply digested and enter the blood streams by osmosis, as any other digested material."

ASSUMPTION VERSUS FACTS.

W. B. MILLER, D.D.S., ALTOONA, PA.

Editor Items:—My attention has been attracted to the translation of an article by Adolph Peterman, published in the August number of "The Dental Cosmos," page 511.

The subject of the article in question, and motives which prompted the writer in the expression of an opinion, as to the "alleged irregularities, and deplorable condition" existing in our American Dental Colleges, are certainly commendable; and in many instances are only too true. Therefore, any effort on the part of individual practitioners of *recognized ability* to expose these "irregularities," and effect, if possible, the much needed reformation, will, unquestionably, meet with the hearty approval and co-operation of the American representatives in the dental profession. But that irregularities in conferring the degree of D.D.S. are confined to "unqualified foreigners," is certainly an injustice, which is capable of demonstration, we think, beyond a reasonable doubt.

Although the German empire and other foreign powers are thus afflicted and burdened with unqualified practitioners, who are at least familiar to a limited degree with the linguistic twists and crooks of their own mother tongue, we are bound to admit the additional "deplorable" iniquity of being victimized by the American born, American graduates, whose knowledge of the English language is equally deficient and limited with that of foreigners, and who have obtained the degree of D D.S. under circumstances which are, to say the least,

enshrouded in a cloud of mystery, through which the most acute eye and mind have thus far been unable to penetrate.

Throughout the past ages men who have in their early life been classed as "ordinary workmen," and occupied, in many instances, "very menial positions," have, by their own energy and zeal, ascended round by round the ladder which reached to the highest degree of development, and have been justly characterized as "self-made men," examples for youth, and the ambition of future generations.

If, in the consideration of this "deplorable state of affairs" concerning the graduation of unqualified foreigners, there should be any lack of evidence, we would offer the suggestion that additional proof might be obtained from the early history, subordinate position, and preliminary qualifications of some of our American-born—American graduates—foreign practitioners which would give some additional light upon the subject, thereby facilitating what otherwise might prove an arduous undertaking and fruitless investigation.

To my own knowledge "illiterate" Americans,—“lacking even the rudiments of an education,” who, previous to their *debut* in the dental profession, have occupied "the most subordinate positions" in life and without social standing or recognition—have, under misrepresentations or otherwise, *mysteriously* gained admission into our dental colleges, not even having the benefit of the experience of a "journeyman in a dental laboratory," and have, in a few short months, sailed forth upon the sea of professional life, not unfrequently drifting, as it were, with the tide to some foreign shore full fledged doctors in dental surgery.

A striking illustration of the brilliant opportunities and enviable possibilities that there await, and hail with delight, his arrival, may be found in the following, which is a verbatim copy from the *Altoona Morning Tribune* of October 11, 1883:

"A successful Altoonian.—Dr. ——— returned to his home in this city, from Europe yesterday, looking exceedingly well. Since his *debut* in the dental profession four years ago, it can be safely said that no young practitioner has met with such unparalleled success. After being a teacher in the dental department of the University of Geneva, Switzerland, for one term, he resigned his appointment and located for practice at Montreux, on lake Geneva. Since that time he has been appointed dentist to the German Courts of Wurtemberg, Bavaria, Baden, Weimar, Hesse Darmstadt, and to the Governor-General of Warsaw and Odessa. A few days before his departure for home, he was consulted by the Emperor of Austria, and also had the honor of being in professional attendance on Prince Albert Victor, eldest son of the Prince of Wales, and also on Prince William of Wurtemberg, heir apparent to that throne, and on the late Leon Gam-

betta, Prime Minister of France. The doctor, after arranging the affairs of his deceased mother, will return to Europe by the Guion steamer Oregon, which sails on the 23d inst. That success may continue to attend him in the future as it has in the past is the wish of his many friends in Altoona."

Now, dearly beloved members of a noble profession, those of us who have not been so fortunate as to rise to such "unparalleled eminence"—mushroom-like, in a single day—is it any longer to be considered, in the light of the "19th-century wonders," that "illiterate, unqualified foreigners," or American born, ambitious young men, should make an effort to obtain the degree of D.D.S. when such vast fields, in their fullness and ripeness, are ready for the reaper? But, alas, "'tis not all gold that glitters," and the first brilliant star of the series forming this constellation, *viz*, the Geneva star, has twinkled its last twinkle, according to the latest accounts from the secretary of the Dental Department at Geneva, Switzerland, as the following letter will show:

"GENEVA, SWITZERLAND, NOV 17, 1883.

"I have the honor to inform you that Mr. ——— is absolutely unknown in the dental school at Geneva, where he has never exerted any function."

Our brilliant hopes and ideas are thus cruelly blasted, and as with Jonah's Jonah, gourd, the suns of that foreign clime have blighted and withered the edifice in all its gorgeousness and brilliancy, and poor Jonah is left to eke out an existence in the German empire, growling and grumbling at the Father who, wisely or unwisely as the case *may seem*, created him, in all His magnanimity, a D.D.S. of an American Dental College. The closing inquiries of the forgoing shall be:—How is it possible that an "illiterate" American dentist—who has thus had the whole professional cares and responsibilities of the various foreign empires thrust upon him—can thus devote his necessarily valuable time in an effort to expose the irregularities of our American dental colleges? How can it be possible for the American D.D.S., with "but the rudiments of an education," to so readily and aptly acquire the linguistic advantages of a foreign tongue, sufficient, in their passage from shore to shore, as to enable them to assume the duties and responsibilities of a teacher in the Dental Department at Geneva, Switzerland?

Biblical history is responsible for the incident relative to "Jonah swallowing the whale," but we Americans, who are thus ignominiously sought and hounded by our "illiterate" American prodigy, have evidently been the victims of a retrograde metamorphosis which utterly incapacitates us from swallowing this *huge monster*, a whale born in America and nurtured ("unparalleled") in a foreign empire.

In conclusion, we would assure Dr. Adolph Peterman that it has not been the intention of the writer to cast any insinuations upon his ideas and recommendations offered for the future welfare of American dental colleges, but would recommend, that if in the future he should feel disposed to refer to this or any other subject of such vital importance to the dental profession throughout the world, that he refer to recognized American authority as corroborating testimony, and cite examples which are worthy of imitation.

N. B.—Should the ambitious D.D.S., to whom this modest allusion is made, feel sufficiently grieved to make an effort at self-defense, and thus maintain intact, unimpaired, this “unparalleled eminence,” we shall be pleased to make public to the profession his name artistically engraved upon a suitable memorial tablet, accompanied by further evidence more clearly establishing his identity and to what degree he is entitled to this “unparalleled” distinction and honor.

“A MOTHER TO MOTHERS.”

CAUSES OF DECAY AND ITS PREVENTION.

And now, a few words as to the better understood and more avoidable *causes* of the decay of the teeth, and the possibilities of its prevention.

Dr. Marvin, of Brooklyn, N. Y., says :

“Purely preventive treatment must begin far back, antedating birth, conception, marriage. In the girlhood of the yet future mother, the instructions should be given which, if followed, will secure uniform physical development, perfect nervous balance, a healthy circulation, good digestion—in a word, promote robust health. This is the time for, and this *is*, preventive treatment. It consists of nutritious diet, regularity of habits, exercise in the open air—(such exercise as employs all the machinery of the human frame, as walking, horseback riding, rowing); a style of dress which does not hinder the free action of the internal organs, which does not distort the body nor weigh unduly upon the abdomen, nor overclothe one part, leaving another unprotected; regular and consistent habits of thought; the cultivation of equability of temper and sufficient sleep at proper hours.

Such habits of life, many of which I know are not *fashionable*, will prepare a woman to transmit to the children she may bring into the world, an inheritance of incalculable value and permanent duration.”

This is but another way of saying what I have been urging upon you, from the very first of these letters; for what will give robust health, will make and maintain good teeth.

You ask, then, why do the teeth decay?

First, we will look at the natural surroundings of the teeth.

They are constantly bathed in the fluid secretions of the mouth; they are implanted in the fibrous tissue covered with a membrane which secretes large quantities of mucus; and they are kept constantly at a comparatively high temperature.

You know that when acids, such as lemon juice, vinegar, or strong medicines, are accidentally spilled upon the marble top of your side-board, wash-stand or bureau, that is permanently injured, if they are allowed to remain there; the fine gloss is destroyed, the surface roughened, and if a round drop stands long, a little pit is formed.

Now, marble is one example of *lime* formation and your teeth another. All *acid* foods, fruits, drinks, medicines, tooth-washes or powders, are therefore injurious to the teeth if allowed to remain about them.

"Most people have experienced what is commonly called teeth set on edge. The explanation of it is, the acid of the fruit that has been eaten has so far softened the enamel of the tooth that the least pressure is felt by the exceedingly small nerves which pervade the thin membrane connecting the enamel and the bony part of the tooth. Such an effect cannot be produced without injuring the enamel. True, it will become hard again, when the acid has been removed by the fluids of the mouth, just as an egg-shell that has been softened in this way becomes hard again by being put in water. When the effect of sour fruit on the teeth subsides, they feel as well as ever, but they are not as well. And the oftener it is repeated, the sooner the disastrous consequences will be manifested." *Therefore*, rinse your teeth promptly and thoroughly, with an alkaline wash (simple lime-water is good) to neutralize all such acids; and your teeth will not decay from *this* cause.

Food of any kind, if allowed to accumulate around and between the teeth, will, in the natural high temperature of the mouth, *ferment* and generate acid, which will cause the teeth to decay. *Therefore*; keep your teeth scrupulously clean, and free from all particles of food, and they will not decay from *this* cause.

Cracking nuts, and *biting threads*, will fracture the enamel and allow acids to penetrate to the dentine, inducing rapid decay; also allowing ingress to the *germs*, *bacteria*, and what not, which are supposed by some, to run riot in the animal tissues of the teeth. *Therefore*; do not crack nuts, or bite threads with your teeth, and they will not decay from *this* cause.

Very *hot drinks* and very *cold drinks* will have the same effect upon the enamel of your teeth, that the same sudden changes of temperature would have upon a fine glass goblet. *Therefore*; do not expose your teeth to these changes of temperature (for instance, a cup of very

hot tea or coffee, followed by a glass of ice-water) and your teeth will not decay from *this* cause.

Dr. Richardson, (of the Odontological Society of Great Britain), thinks that one of the most serious causes of the decay of the teeth is found in the form of dyspepsia induced in early life by improper feeding, especially in the substitution of artificial foods for the natural breast milk. * * * the child deprived of its natural and admirably adapted food, and supplied with nourishment which its stomach could not digest, nor its body assimilate, its tissues, generally, were imperfectly constructed, and although it might retrieve in after life some of the harm which had been inflicted, in the case of tissues which are constantly undergoing reconstruction, in the case of such dense strictures as the teeth, perfection was impossible if the start was bad."

Another very frequent cause of decay and irregularity of the teeth lies in the inheritance of incongruous jaws and teeth from the two parents. The *father* having large teeth in a corresponding jaw, and the *mother* small teeth in a small jaw, though both may have perfect sets of teeth, the inheritance may nevertheless be most unfortunate for the children. The *teeth* being as a rule inherited from the *father*, (Drs. Winder and Coy say eight times out of ten), and the bones—including of course the jaw—from the mother, the large teeth of the one being crowded into the small jaw of the other, the teeth of the children will probably be irregular and overlapping, and cleanliness consequently next to impossible.

But these things are rarely taken into consideration when young people *fall in love* and marry, and a *little rosebud mouth* is so lovely in a woman's face!

Reverse the case and let the father have small teeth and the mother a large jaw and the happiest results may be expected in the next generation. And this about exhausts the list of the more ordinary causes of decayed teeth.

There are others, attributable to *hereditary* and *transmittable* diseases, which are beyond control, as society now exists. This may appear a very delicate subject for me to touch upon, but it is nevertheless a fact that until the *culture* of the human race is made a matter of as much consideration as the raising of fine poultry or live stock, men and women, who have no *moral right* to bring into the world children to inherit and perpetuate disease and suffering, will marry and transmit the curse of hereditary and incurable disease, to unborn generations yet to come.

And teeth will continue to decay, from *this cause*, so long as these things are not understood and made a matter of serious consideration, *before marriage*.

MY OWN FAILURES.

DR. W. D. DUNLAP, SELMA, ALA.

Beginning our career as a dentist during the reign of Soft Foil, and in the midst of the celebrated Townsend controversy, on amalgam, with not an educated dentist anywhere in reach, the duties of a practitioner were assumed. We soon found that we had failed in laying in a Technical education; that we had not learned either theory or practice, nor could we apply them the one to the other—first and most important failure, in this day inexcusable. An office is opened, and the public invited to bring their ailments for treatment. Now all the ills that flesh is heir to—through the dental organs—toothache, abscess, periostitis, neuralgia, salivation, syphilis, dyspepsia, earache, deafness, etc., come trooping in solid phalanx, asking aid from our small stock. Some are treated with simple remedies, others dismissed as trivial and transient ailments, while the remainder are turned over to the medical practitioner as belonging to his department. As to remedies, let us see how they work. A case of toothache presents itself; something is applied, the pain is stopped, and the patient dismissed without a word—the present trouble is bridged over. Another case on hand; extraction is requested. Without a careful examination as to the requirements of the case, at it we go—usually with success, but often failing; the crown crushes, leaving the roots, or it may be a portion of one or more, deep seated in the alveola. Trusting to the expulsive powers of nature, we conclude to let them remain; some times they give no annoyance, while at other times they cause great suffering. Where relief is not afforded by these efforts, I record failure again.

Now, if it were possible to restore these teeth to a normal condition, and the patient were both able and willing to have it done or attempted, I have more signally failed to do my duty. Why? Because the first, therefore the most important duty confided to us is the “conservation of the teeth.” ’Tis true that in many instances extraction may be necessary; but when it is not called for by plain and unmistakable terms, I may properly blame myself for doing it, and feel again that I have made a failure.

Now let us see how the matter stands with another case that presents itself. The patient comes in hurriedly, suffering greatly, and asks to have a tooth extracted. A hurried examination, reveals extensive decay; no question is asked, no suggestion is made, but the offender is removed. In a day or two the patient returns, and another tooth is taken out; but the third time he comes back designating another. Perhaps by this time a faint idea is growing in the mind of the sufferer that he will sadly miss so many teeth, and asks that an effort be made to save this one. It is done, with seeming good

results. Now a disagreeable suspicion floats through my mind, that the latter tooth has been really the offender all the while. 'Tis true the others were in a bad condition, but were probably in better condition to treat successfully than the latter. If this be so, I must record failure again—knowing my duty, I did it not. Perhaps I console myself with the idea that I only did what I was asked to do. So far true; but responsibility requires that every other remedy shall be exhausted first. The patient should have been advised as to the importance of the organ for mastication, etc., and the probabilities of restoring its usefulness, the time necessary to treat it properly, and the probable expense. These things should be plainly set before the sufferer, and, with his consent, the effort honestly made. By so doing, I avoid reproach for failure. We have now before us a trial of judgment and skill in an effort to restore the tooth to a healthy condition. What shall the treatment be? The choice lies between extirpating the nerve, in part or in whole, or by treatment restore it to health, and judiciously fill. Perhaps I decide to destroy the nerve; arsenic is applied, the nerve removed; the canals enlarged, and an effort made to fill from apex to crown. In one, the filling does not reach the apex, leaving an opening for the retention of fluids when eventually decompose; in another, a portion of the filling is forced through, and remains there to irritate the surrounding parts. Some times nature tolerates these conditions wonderfully, and no trouble ensues; but often trouble does ensue. The tooth is treated for a time, but has finally to be removed. Growing out of the numerous failures following this treatment, and a desire to find something better, close attention is given to treatment that may preserve the nerves in health. These efforts are confronted with many difficulties—the greatest, perhaps, being the want of knowledge as to the exact condition of the nerve, either before, during, or after treatment; but I try the plan—subdue the pain, release pus, and stimulate the nerve to throw off disease—every thing seems favorable. I then fill, but to find out sooner or later that either I have made a mistake as to condition, or have committed a blunder in mode or manner of filling. So, in this line I find failures of frequent occurrence. I am somewhat reconciled to this experience when I remember that I can, as a last resort, try the first plan, thus giving the tooth two chances.

Now we have not related all the failures that ensue from either plan, although a large majority of such operations may be classed as a success, as they are not heard from again. Yet even among those classed as successful, I am satisfied if I knew their history I would be less confident of their success. Then in plain and compound fillings, here and there, now and then, with napkin, spunk, bibulous paper, or rubber dam; with gold, soft and cohesive, singly or combined;

with amalgam, gutta percha, or any of the cements, with wedge-shaped or serrated pluggers, hand-pressure or mallet, a filling fails through some fault of mine—I can not hide it from myself—yet how is it that I am alone in this experience.

It falls to my lot to have a child put under my care at an early age; the teeth are soft, I clean and fill, give careful directions as to how best to preserve them, and the directions are carried out; every six months I examine, fill, file, and clean; but, alas, one and another of the teeth give away, and finally, perhaps long ere middle age has been reached, every tooth is out and their places supplied with shop teeth; while with a feeling of relief the martyr to dentistry utters a “thank the Lord, they are all gone,” and goes out to extol the merits of the substitute. Here, too, I appropriately inscribe failure on my banner.

I am told that my failures in filling arise from not preparing my cavities well; that I cut away too much or too little; that I do or do not use retaining points; that I put in too much or too little gold; that I should use soft foil; that I should use cohesive; that I should use amalgam, or some other plastic, that I never should allow myself to use amalgam, etc. Bewildered, I drop my wedge-shaped pluggers and soft foil, I turn to serrated instruments; work them by hand, then by the automatic, followed by the hand-mallet, from two ounces to a pound in weight; then the electric plugger. I give large V shaped separations—on Arthur’s style—then I wedge or drill from crown, in hopes of hitting the line of an approximal cavity—may miss it some, but can finally succeed by enlarging enough. What does the loss of so much structure amount to? Nothing, when the tooth is saved; but as I sometimes lose one of these fillings, I often find at second trial that the tooth is gone, sacrificed to the theory of no separations. The result, of course, is due to imperfect work.

I discard amalgam, but to take it up again; change my mode of work, but to either try something new, or go back to some old and well-tried method, and be content to learn that each and every plan that has yet been devised to save the teeth will be accompanied with numerous failures, if I have any thing to do with them.

I might tell you how I have labored with abscessed teeth and the varying results—sometimes curing the abscess, restoring the teeth to usefulness for a while, but the trouble finally returning; removing necrosed or denuded alveolæ; excising the denuded portions of roots; of efforts to adapt artificial dentures to the mouth—and the many marked instances of failure; pivoting by the old method, by Peabody’s, Richmond’s, Bonwill’s and others, and the failures that follow; riveting or banding split teeth; controlling toothache, neuralgia, correctly diagnosing odontoblasts, and other calcific matter in pulp cavities, pulpitis, periostitis, or exostosis, pyorrhœa, alveolaris, or

senile decay—in fact, in every department of the profession I have, and do make repeated failures, both in judgment and skill, and so confess to you, and express my humiliation at the fact and an earnest desire to avoid them. It is true that sometimes I catch a glimpse of what looks like a failure, coming from those who are eminent and have impressed me with their infallibility. But this very confession will bar my evidence, as I have shown you how liable I am to err; so that you may readily believe that I am unable to distinguish between success and failure.

Now, sirs, while I have made these confessions, I have avoided any allusion to the other side of the subject. I appeal to you all to observe well, and see if we are justified in taking as strong positions as we usually do in defence of our peculiar modes. Will the facts sustain us? If not, let us retrace our steps and take a position that we can maintain, lament our short comings and try to overcome them, be not too confident or boastful lest we come to grief, and ever bear in mind that in each and every plan there is more or less that is good and should be retained for use at the proper time and place. Do not let us limit our resources, but be prepared to draw forth things new and old, and apply them to the credit of the profession and the good of humanity.—*Alabama Dental Society.*

The Value of Healthy Roots.—The value of the remains of teeth when restored to a healthy condition and rendered useful, either as carriers of artificial crowns or as supports to substitutes, being established, would lead to the enquiry whether, excepting in cases of dental regulation and preservation, a tooth should ever be removed from the mouth, except where it may be the source of evil excited in more distant parts, which cannot be controlled.

Excision I believe to be better surgery than extraction in all those cases of simple odontagia where the disease is confined to the tooth, and where the crown is too far gone for restoration excepting by an artificial replacement.

Replantation of teeth for the purpose of the reduction of disease, and their final restoration to usefulness within certain limits, should form a distinct study. That this has been done successfully by some is well known, but it has also been attempted by others and ended in failure. It naturally follows that the two experiences lead to a divergence of opinion that is most unsatisfactory, and can only be set at rest by the fuller knowledge afforded by more extended observations and experience.—SPENCE BATES, F.R.S.

DENTAL EDUCATION.

DR. A. JACKSON.

Part of a Paper read before the Alabama Society.

Skilled brain power and the treasures of a well-stored intellect are not the heritage of man. He has the power to think, to reason, to master difficult problems, to search into the secrets of nature, and to penetrate the mysteries of science with his keen intellect; but all these require, thought, research, and unremitting effort. The practical application of this doctrine enabled an obscure Corsican to rise, like a giant from his lethargy, and seat himself on the throne of the Bourbons; it enabled Lord Nelson to decree at Trafalgar that proud England should still be mistress of the seas; and it enabled Cæsar to make Rome so powerful she could sit on her seven hills of beauty and rule the world. It enabled Michael Angelo to carve the beautiful form of an angel out of unsightly rock; Raphael to spread upon canvas his immortal Madonna; and Leonardo to signalize himself as the genius who could grasp art and science with hitherto unknown power. It enabled Virgil to tune his lyre to the praise of Æneas in the sweetest melody; Homer to sing of the exploits of his countrymen in immortal song, and Milton to portray in sublimest verse the daring sacrilege of the fallen angels. It enabled Humboldt to advance to the foremost rank of the world's great scientists; Agassiz to tell, by examining a sea-shell, the age in which the animal lived that inhabited it; and Cyrus W. Field to *perfect* the magnetic telegraph—that wonderful agent by which a man sits at his table in New York and talks with another who is far beyond the broad Atlantic. The epitome of wonders is not yet exhausted. It has given to chemistry the power to seize great secrets from the laboratory of nature; to engineering the skill to cut railroads through rocky mountains and under deep streams, to build suspension bridges over broad rivers, and to connect remote seas by artificial channels; and it has given to medical science the remedies to heal malignant disease and mitigate human suffering.

Skilled brain power, combined with diligent research and concentrated effort, has achieved marvellous results in our profession during its brief existence. While it is but yesterday since it sprang into being, yet the discoveries it has brought to light, and the mechanical contrivances and remedial agents it has summoned to its aid, justly entitle it to claim equal rank with any of the learned professions. In speaking of its brief existence, we do not wish to be understood as disputing the facts of history bearing upon its origin. Dentistry, in some form, probably existed as far back as the mythic period of Greece. Upon no other hypothesis can we account for the fact

that the old classic poets, Ovid and Horace, speak of it. I may add, too, that mummies have been found in Egypt, and skeletons have been taken from the tombs of the ancients, which showed the handicraft of the dentist. In this instance we are not led to exclaim, "hark! from the tombs a doleful sound,"—but hark! from the tombs a *significant* sound. The conclusion to which these facts point, is, that some attention was paid to it in the earlier ages of the world, but what was known of it as a science perished beneath the torrent of Goth and Vandal ignorance, or went down in the night of time. Its secrets were left buried for a long period, and not until the present century were they brought to light again. John Hunter contributed much to this result by his learned treatises, and thus laid the foundation of the Dental School of England. The French dentists made wonderful progress in the profession about the same time, and their scientific researches have brought valuable aids to its development. But to Leonard Krœcker, of our own country, is due the credit of causing it to take rank as a distinct profession. He practiced dentistry in New York soon after the revolutionary war, and his scientific lore and mature experience caused it to shoot forth, like a meteor, in a blaze of splendor. Since then it has always ranked as a separate profession. It now stands upon an equal footing with that of the aurist, the oculist, and the medical practitioner. Its claims to scientific recognition have been placed beyond all question, by the schools of learning it has established and the valuable discoveries it has given to suffering humanity. Science is the keystone upon which it rests. It calls to its aid anatomy, philosophy, physiology, mineralogy, the secrets of chemistry, and the principles of mechanism. These great agencies are the talismanic sounds that have lifted it into an elevated position in the minds of the intelligent and educated, and to them must we look to sustain its well-earned prestige. The rise and progress of dental science, its aims and results, are interesting, not only to members of the profession, but to all persons of inquiring minds and liberal culture. During our war of Independence, there was only one dentist on the Western Continent, and he was one of the noble Frenchmen who came to the rescue of the colonies in the most critical hour of their fortunes. When George Washington was President of the United States, there was but one in the great city of New York, and to his honor be it said, he prepared a full set of ivory teeth for "the Father of his country." When Alabama was admitted into the Union, there were only one hundred in all the States. Now the aggregate number reaches far up into the thousands, and they are found in almost every city, town and hamlet of the thickly populated portions of the country. This statistical exhibit is pregnant with meaning. It shows the level of the times, and that, so far as public favor

is concerned, we are fully abreast of our sister professions in this age of progress and scientific lore.

Much of our progress has been due to our schools and colleges and to our State and National conventions of dentists, by means of which we are educated in the latest discoveries of science. Another great cause of our progress results from the fact that our attention is mainly directed to the treatment of a single organ. The chief reason why more is not accomplished, in the learned professions, is because mental power is not concentrated upon special branches. Men achieve but little, because their labors are diversified. The road to success is through specialties. Mental power, like a large stream, wastes its forces when spread over a vast surface, but when concentrated, it sweeps onward with a momentum of a mighty cataract. Our age is too complex for one to master learning and grasp all the sciences, but if he knocks with a resolute hand at the door of a special branch, he has strong reason to believe that "to him that knocketh, it shall be opened." "The man that seeks but one thing in life, and but one, may hope to achieve it before life be done."

Although the French, English and American schools of dentistry have done much to acquaint us with the secrets of first dentition and the diseases that accompany it, as well as the different subjects relating to the prevention and cure of the diseases of the teeth; yet the rapid progress for which we are indebted to them, can be better illustrated by referring to the improvements in mechanical dentistry. It appears from the advertisements of old newspapers that this branch of our profession was once in the hands of jewelers and silversmiths, but our handicraft has set at naught this branch of their business as effectually as the mission of the Apostle Paul set at naught the trade of Demetrius, the silversmith and his fellow-craftsmen.

The importance of dental education becomes more apparent when we consider that its prime object is to relieve pain, and promote the health and happiness of the human race. Owen Meredith tells us we may live without poetry, without music, without conscience, and without books, but we can't live without cooks. To this may be added we can't live and enjoy health without teeth to masticate the food the cooks prepare; and without health even the dreams of romance and the splendor of kingly magnificence cannot be enjoyed. "O, blessed Health! thou art above all Gold and Treasure." The machinery of man is so delicate, so complicated, and so nicely adjusted, that the disease of a single nerve will throw his whole organism out of order, and thus prevent the parts from performing their functions. It is the province of the dental surgeon to minister to some of the worst of these nerve disorders, and prevent and cure their racking torture.

Our dental journals, our schools and colleges, and our State and

National conventions are fine media for disseminating knowledge and communicating the improvements in our profession, and they have accomplished much in their respective departments.

Ours is a noble and honorable profession, and our mission is one of mercy and humanity. It behooves us to work earnestly and zealously to raise it still higher on the pillars of science, and to elevate its ethical and humanitarian standard.

Taking as our motto the fine sentiment of Terence, "I am a man, and all things human touch me," let us press onward and upward and, with compassion in our hearts, make it the thought, the wish and the dream of our lives to help and to heal the sick who lean on us in their affliction.

THE PROMOTION OF OSSEOUS DEVELOPMENT.

GEORGE WATT.

Read before the Mad River Valley Society.

In the statement of the proposition it is taken for granted that bone may be developed, and that such development may be encouraged or promoted.

In a constitution perfectly healthy and well balanced, the bony tissues are developed exactly to the extent that they are needed; but in this proposition it seems to be taken for granted, also, that the process of development is not always well balanced. It may be easy for one constitution to develop bone, while it partially fails in the development of muscular tissues. In another, the constitutional tendency may be toward the development of nervous tissue, while another runs to fibrous tissue in general.

The question now comes up: "Can we, in cases of badly balanced development, do anything to restore or to establish a constitutional equilibrium? All will admit that by violation of the laws of health we can do much to bring about an unbalanced state of the constitution; and it seems but reasonable that we ought to be able to do some good by a reversal of the process.

In a "one-horse shay," and in any machine, the weakest place must stand the strain, and the way to guard against its breaking, in order that it may be honestly worn out, is to "make that place as strong as the rest." We may thus get a hint on the subject before us. If an organ or function be weakened, so that it partially fails to do its part in the economy of the system one of two things seems to be called for: We may endeavor to render its work easy, so that it can perform it, notwithstanding its debility, or we may try to arouse it to increased energy of action. Either process may, for the time restore or establish the desired equilibrium; but the latter mode may

be similar to the plan of whipping or spurring the exhausted horse. Just as in case of the horse, we must inquire whether the defect results from sluggishness or from exhaustion. If from the former, we may stimulate, but if from the latter, we would only do mischief by such a course. We saw this plan illustrated when a boy. A shiftless man, with a team, stopped to beg a dinner for himself and some thread to make a whip-cracker. While eating and repairing his whip, his horses stood tightly reined in the hot sunshine, and we were not surprised to see that he was fatter than his horses.

All tissues are formed from the blood. "For the life of the flesh is in the blood" is a physiological truth, taught by infallible authority, many long centuries before Hippocrates. Hence whatever is to be built into the body must be passed to it through the blood. And so it follows that no tissue can be nourished unless the blood contains the materials necessary to its nutrition—the materials of which it is composed. It does not follow, however, that an organ will certainly be nourished because the blood contains the desired nutritive principles, for it may not be able to appropriate that which is prepared and ready for it, just as a man may starve in full sight of food, because not able to take it.

It must be always borne in mind that the nutritive functions create nothing. They cannot use that which is not already formed. And let it be remembered, too, that all organic bodies are built up in strict accordance with the laws of chemical combination. Vitality modifies chemical action, but never contradicts or destroys it. It may determine what combinations can take place under certain circumstances, and what can not. It may prevent one, and promote another combination; but, in order to promote any, the materials must be there to combine.

Furnishing food for vegetable life is commonly called manuring; and when feeding his plants the intelligent farmer tries to know what his soil contains, and what are the constituent materials of his plants, and if the soil is short of these constituents he supplies them. An instructive case of this kind is recalled by memory. A minister of the gospel owned a farm. He called on a man who had some reputation as a chemist, and asked him if he was prepared to analyze soils, and was told that want of time was the only lack, but that would prevent his giving any attention to the soil; but the chemist added: "If you tell me what is the trouble, I may help you without an analysis." "Well," said he, "it will not produce anything." "But that is a slander on your field," said the chemist; "any field you have will bring something. Can you raise straw or corn-stalks on it?" "Why, yes," said the man, "great crops, but no grain." Knowing the land to have a sufficiency of lime and magnesia, the chemist told him to

give the field a dose of phosphorus, otherwise bone ashes. The remedy was tried, and a wheat crop of twenty-five bushels to the acre, followed by a crop of corn of over seventy, was the result.

The same principle governs in animal life. Just as the rootlets of the plant cannot find and use from the soil that which is not there, so a tissue cannot appropriate from the blood ingredients not contained in it. We have already alluded to the fact that chemical laws are not violated in the formation of living growths; and as quantity of matter is one of the modifying circumstances of affinity, it follows that when anything essential to the development of any texture is deficient in quantity in the blood, the development of that texture is promoted by furnishing it in greater proportions to the circulating fluid.

In ordinary constitutions, some essential constituents are more readily assimilated than others; and this is not more a matter of surprise than is the fact that some foods are digested with greater facility than others.

Bone, like other organic matter, is composed mainly of carbon, hydrogen, oxygen and nitrogen. These constitute its diet, but not its dessert. For this it wants salts, and similar materials; and an important, if not the most important one, is the subphosphate of lime. At the risk of disturbing a friend, we will state this is not the neutral phosphate, but a much more stable salt—one that will endure a white heat, without decomposition. To distinguish it, some of the older chemists have recommended that it be called simply "bone phosphate." Not only is this ordinarily the most important salt concerned in osseous development, but it is often, if not always, the most difficult to obtain and assimilate. And this statement is all the more confirmed by the fashionable habit of separating the greater portion of the phosphate from the food producing grains before using them. As early as 1854, we called earnest attention to this, recommending that whole grain flour be substituted for the white family flour of commerce. We had been administering the bone phosphate as a medicine, to aid in bony development, from the time we began practice, in 1844, and we never had cause for discouragement in its use. Good results were uniformly obtained from its administration as from other medicines. Prof. Taft will remember a case thus treated, in 1849 and 1850, with the most satisfactory results. At the risk of hearing something told you before, please listen to a report of this case:

Mrs. M., aged 25, was the mother of two children. She had suffered much from defective dentition, and needed an upper artificial denture. The two children had scarcely any sound teeth, and were often crying with toothache. A third conception had taken place. From about the third month of utero-gestation, at our suggestion, she

used daily, and usually three times a day, the bone phosphate. From a pale, emaciated woman she became full-faced and rosy-cheeked; had an easy, natural labor; the babe weighing over twelve pounds; and this child, in time, had a most excellent set of temporary, followed by an equally good set of permanent teeth. The phosphate was continued during the period of lactation. The contrast between this child and the other two was too decided to be accidental; and the case is merely a type of others treated in a similar way.

In 1855, we mentioned this case to Dr. Elisha Townsend and a few other dentists. One of them reported it to his family physician, and requested that his wife be allowed to follow the same course. The physician feared that it might render the labor more difficult, but the phosphate was administered in rather limited quantities. The result was quite satisfactory, and continued to be so till all but the third molars were developed. We then lost sight of the case. The other children in the family had very defective teeth as compared with the one aided by the bone phosphate.

The phosphate used in these cases was prepared by dissolving bones in hydrochloric acid, precipitating with ammonia, and washing and drying the precipitate. We do not think any better form of the medicine has been suggested, but some have been prepared so as to be more pleasant and palatable.

But food is better than medicine. Let foods rich in the phosphate be used. The lean meat of beef, mutton, fowls, etc., answer a good purpose. Cracked wheat, oatmeal grits, if properly prepared, are also valuable. From experiments tried long ago, we were led to believe that veal and pork are not so rich in the phosphate as are the meats above mentioned.

Some authors speak of the subphosphate being unreliable, if not inert, as a medicine, on account of its insolubility; but their objection loses force through their accompanying statement that it is *highly soluble* in hydrochloric, acetic and lactic acids. We may add that it is also highly soluble in solutions of carbonic acid; this being the agent that holds it in solution in normal saliva, which can be well remembered by association with the fact that it is the removal of the free carbonic acid from the saliva, by ammonia, that causes the precipitation of this salt in the form of tartar. As all four of these acids are common in the stomach, there can be but little difficulty in obtaining a solution of the salt in it during the process of digestion.

Others have objected to the use of this salt on the principle that inorganic matter cannot be assimilated by the animal economy. But as this drug is obtained by solution and precipitation from *bones*, the inorganic objection falls.

If readily obtainable, it is well to use some of the more elegant

preparations, such as wheaten phosphates, lacto-phosphate syrup, etc., but sometimes a fatal delay occurs, because these are not at hand. If not already prepared, the preparation of the salt is so simple, and the chemicals needed in the process are so readily obtainable, that there is no excuse for delay or negligence.

In considering this topic, it is to be understood that all the nutritive functions are to be in good working order. Sometimes the digestive apparatus and the assimilating powers are so feeble that they are scarcely able to develop any of the tissues. If possible, these are to be restored to health and strength preparatory to special development; for we can scarcely promote osseous development when the vital powers are so enfeebled. And this state of affairs suggests counsel and co-operation with the family physician, provided he is competent, and not an empiric.

To sum up, let us bear in mind that all tissues are built up from materials taken from the blood; that the nutritive functions create nothing, but only digest, assimilate, and appropriate; that, therefore, unless the needed materials are in the blood, in the required quantities, there must be defective tissue building, or no development of tissue at all; that when the needed materials are abundant, there must be, other things being equal, a better and fuller development than when they are deficient in quantity.

We have tried, in a hurried way, to discuss the general principle, rather than to give receipts. Such a course is more likely to call out original thought.—*Dental Register*.

CAUSE OF TOOTH DECAY.

[Addressed to the Editor of the *British Journal of Dental Science*.]

SIR:—I hope by the evidence of my personal experience to set at rest the unfounded theories advanced at the present day as to the causation of dental caries by micro-organisms.

I left home in Scotland in 1860 to go as assistant in an English town, having, when I left, a perfect set of teeth. Before I had been in England twelve months I had several decayed teeth. When I became aware of the fact, I at once set to work to discover the cause, and, if possible, to remedy the existing state of matters. The result of my investigation was, that I found the decay was the result of the action of acid, and the acid was formed in the stomach by improper diet.

Before I left home my breakfast consisted of porridge and milk principally, and the bread used in the household as a rule was two days old.

In my new abode instead of porridge for breakfast, hot cakes,

new from the oven, tea, coffee, etc., and always new bread at meals. It was sometime before my stomach was affected, but at length I began to suffer from acid eructations, and heartburn (erroneously so called), really stomach burn. This affected the oral secretions which most certainly was the cause of decay, as the sequel will prove. I took steps to alter my diet, and to neutralize the acid secretions, and used to send to Scotland for oatmeal, which, in conjunction with coal in cleanings, has had the effect of arresting decay; so that to-day the majority of my teeth are quite sound, with the exception of those that had been affected in 1860.

Another feature in decay I have observed, and which I have not seen taken notice of elsewhere, is that there are two classes of decay: in carious teeth, in the majority of cases, I find the decay of a moist, tough consistency, but in other cases it is what I should characterize as dry rot; on being removed by the excavator it comes away in the form of a dry powder.

That micro-organisms are present in carious teeth no one will deny; but they are introduced from the food we eat, the water we drink, and the very air we breathe; it is an acknowledged fact that many parasites are found in other organs in the bodies of man and the lower animals. Finding congenial quarters they settle, increase and multiply.—JAMES HARDIE, 12, Lothian Road, Edinburgh.

AMALGAM.

S. C. G. WATKINS, D. D. S.

The insertion of large gold fillings in molars is so wearing upon both patient and operator, and so expensive, that the patient is completely disheartened, and refrains from visiting a dentist again for several years, the result being that there is positive loss, both to patient and operator. Amalgam would be much better in such cases. Our practice to be successful must be based upon a sound philosophy; that is, upon the knowledge of those principles and laws that govern the materials or agents with which we operate, and also those upon whom we operate. We fill teeth that we may arrest decay, prevent pain, assist in mastication, preserve the anatomical contour of the face, lend help to the vocal organs that they may produce certain sounds, as well as to earn a livelihood for our families and a reputation for ourselves. If the circumstances under which we fill teeth are favorable they will greatly assist us in bringing out good results, and the opposite will do much to retard, unless there shall be brought to bear such helps as will completely neutralize all opposition. The first thing to consider in the filling of teeth is the condition of the case in hand, through a faithful diagnosis. To diagnose a case for filling we should notice the condition of the struc-

ture, whether healthy or unhealthy, its location and its importance to its possessor. When its unhealthy condition is changed to a healthy one and all decayed matter removed, cavity shaped, walls formed, edges trimmed and polished properly, we are ready for the filling. Now the question arises, "What shall I fill with?" After a careful and conscientious examination of the surrounding circumstances, I should, a few years ago, have said gold, in most cases, like a good many of my friends in the profession. I received my dental education at the Boston College, and many prejudices against Amalgam were inculcated into my training, and they were generally entertained at that time by most of the able men of the profession, very few having the courage to acknowledge that they used it, or to defend its good qualities. I have seen several cases where Amalgam has stood the wear and tear of forty years. And again, I have seen beautiful gold fillings from the hands of our most skilful operators fail under favorable circumstances.

Unfortunately, we are not all born wealthy. Some cannot pay for gold fillings. Others are not willing to pay for them under all circumstances; and again, some have not the physical strength to endure the insertion of a large gold filling in the back teeth. There is a class of cavities which I particularly wish to call attention to, viz: posterior approximal cavities in the molars, or where a posterior and an anterior approximal come in close contact. In such cases most Amalgam fillings are failures, not because of any fault in the Amalgam or any fault in the tooth structure, but on account of gross carelessness on the part of the operator. In all cases of approximal fillings, whether of gold, amalgam, oxy-phosphate, or gutta percha, the rubber dam should be placed upon the teeth, the cavity properly prepared with under-cuts, from all sides where there is sufficient tooth substance to warrant it, and the periphery thoroughly trimmed and rounded, so that there will be no frail edges, especially cervical-approximal.—*Independent Practitioner*.

The cause of caries has been made a subject of study by many and the futility of individual research is exemplified in the result that almost every inquirer has found a new theory for himself, each of which was identified with the idea preconceived before he even commenced to study the subject, a circumstance that demonstrates how desirable it is that two or more minds should investigate a subject which it is important should be set at rest for the benefit of sound curative treatment. That caries of the teeth is one of these is certain, and the researches of Underwood and Milles are doing much to demonstrate one active condition of the disease, but it appears as yet that the *fons et origo* which induces a nidus for the growth of bacteria has still to be shown.—SPENCE BATES, F. R. S.

HOW TO LIVE.*

DR. HENRY C. CHASE, ST. LOUIS, MO.

FRIENDS AND BROTHERS:—You have sent for me, and I have come more than one thousand miles to address you.

When I asked your Executive Committee what you would like to have me talk about, the answer was, "Anything that pleases you will please us." Well, then, it pleases me to make the whole thing a personal matter—a personal experience. I have always been a willing witness to Truth, as I have tried on all sides to see it. And believing that you also wish to know the truth, I take your hands in love, and give you what I have.

I have practiced dentistry forty-one years. I am going to tell you what I *believe* to be truth. My observations, my studies and my experiments, have resulted in certain beliefs and methods of practice. I think it is this that you wish to hear. I cannot think that you wish me to discuss any particular question which is open to debate, and I do not intend to argue a single question, or to even present you with proofs of my assertions and beliefs. You must take everything on trust, until you can prove or disprove. For I must speak to you as a parent would speak to a child who is not yet old enough to understand the *reason* of things; not because you *are* children, but because there is not time for me to present evidence; for I must not take all the time of this meeting. And some of the subjects, if thoroughly presented, would take several hours.

I have on my watch-key three words, which are my rule of life:—"Health; Work; Love." Without the embodiment of each and all of these factors, life is a failure. These three produce the greatest happiness that Earth can hold. These three are necessary for the fruition of Life's greatest achievements. Health, itself, is the *foundation* of great results. Without health, Love loses half its charms, and Work becomes a burden and a crushing misery.

The laws of health are very simple; they are *Nature* itself. The majority of diseases, light or severe, are the result of wrong feeding. This may be caused by an excess of good food, or the average amount of improper food, or the mixing of incompatible foods at the same digestion.

* [The following address was intended for the New England Dental Society, which met in October: but Dr. Chase was unable to attend, and the Executive Committee were hardly willing to have it read without the doctor being present to defend it in an after discussion. It will well repay perusal; for, though we may not all agree with everything that is said, it behooves us all to study well the teachings of such a successful life. As Dr. Chase says, "Not that I wish you to follow me, but that my daily life may serve you as a *hint*." The second section of the address—"How to have healthy teeth, and how to treat them if decayed"—will appear in the ITEMS for December.—ED. ITEMS.]

I speak to you as dentists ; as men who are compelled to an indoor life ; of a life whose "profession" does not call for constant muscular exertion, like that of a farmer or of a mechanic. Therefore, my friends, your diet should be one adapted to your situation. Continuous over-eating causes congestion of the liver and other internal organs, resulting in a great variety of symptoms, to each of which are attached the name of a disease. *Over-eating* of simple and nourishing food is just as disastrous as the partaking of unwholesome food to a less extent of weight. The eating of incompatibles usually results in *immediate* disorder of the digestive organs, giving pain or disagreeable sensations.

My brothers, you all know how important it is for you to feel well at your work ; having a steady hand and a clear brain.

Now I desire to *preach* to you what I practice, and so I will tell you how I live ; not that I am a perfect pattern of hygienic life ; not that I wish you to follow me, but that my daily life may serve you as a *hint*, how to preserve *your* powers to an old age. I am sixty-five years old. I studied hygiene under Dr. Sylvester Graham, of Worcester, Mass., taking four courses of his lectures in 1835, '36 and '37. I am married, and have six grown-up, healthy children. I have better teeth than my parents had. My children have better teeth than their parents have ; a result of inheritance and good diet. I am in perfect health ; not an organ impaired save my teeth. I cannot remember that I've had a pain during the last twelve months. I have not had "a cold" in a year. It seems almost impossible for me to "take cold" with my habits of life. I get all the fresh air and sunlight that I can. I sleep on a wire bed, in the open air, from July 1st to October 1st. An awning covers me. The wind blows over me in every storm of rain. My bedding is wet through and through, and I stay out in the storm and sleep soundly in the wet bed. This is the last of September that I write this line ; I have not gone in out of the rain on a single occasion, from my bed, since July 1st. Instead of not knowing enough "to go in when it rains," I know too much to go in.

When the nights are hot I step into the bath-tub with my night-dress on, and soak it, then lie down on my bed and let the wind blow over me. You wonder, you look at each other, you smile. And so can I smile ; yes, I can laugh at the elements and hug them as my best friends.

Where is the secret of this impunity from taking cold ? You all mentally ask that. It is this, and here : Keep the blood pure. Keep the blood at a proper volume ; excess of volume invites congestions. Habit of exposure is something, but only a hundredth ; health of the

liver and other internal organs, everything. The liver must be in perfect order, and also not have too much work to do.

I go to bed about 10 P. M., and "get up" about 5 A. M. in the summer, and about one hour later in the winter. Six or seven hours sleep is enough for me. From the age of 25 to 45 I took eight hours in the summer and ten hours in the winter. My active exercise consists in two or three miles of walk per day; in the use of Indian clubs, between calls, at my office, and in various muscular exercises generally included under the head of "Calisthenics."

I wear doubled-soled shoes, with heels not much thicker than the soles. Have an uncovered head at all possible times. "Smoke" not more than once or twice a year, and take alcoholic drinks, wine or beer, not oftener than I smoke. Dress comfortably without regard to seasons. I think you will be very glad to have me acknowledge *one* "bad habit." Yes, I will. I take one cup of coffee every morning. I drink no water with my food, and very often go without it for days at a time, not being in the least thirsty. This lack of thirst is owing to the character of my food. And now I want to tell you about my food.

In cold weather I eat a little beef, mutton, chicken, fresh fish. No, not every day, but about three times per week. Because I am fond of them, and not because I consider them necessary in my case. But from June to October I do not taste of meat more than once a week. I avoid the use of condiments and seasoning, as salt, sugar, pepper, spices, catsups, etc., also pickles, preserves, jellies, rich puddings and pastries, cakes, candies, fried potatoes, and all greasy dishes. I use no pork or lard in any form. As a general thing I avoid soups, mushes, or sloppy foods. Eggs and cheese I use very sparingly.

My diet consists chiefly of good home-made graham bread, made of "Warren's Entire Wheat" flour, and thoroughly baked; fruits: raw or cooked, dried or otherwise; grains or their preparations, as cracked wheat, pearl wheat, pearl or crushed barley, samp, hominy, oat-meal, rice, etc., and a variety of vegetables cooked without seasoning.

I never eat fruits and vegetables at the same meal. The potato is an exception: it can be eaten with either fruits or vegetables. I do not eat many *varieties* of foods at a single meal, but make changes from one meal to another. As a rule I take only one variety of fruit at a meal. If vegetables are eaten I confine myself to about *two* varieties.

If melons are eaten, I take them either for breakfast or dinner. They should be eaten *before* the rest of the meal, and they must never be eaten at the same meal with other fruits. Most raw fruits, particularly grapes and apples, are best eaten at the beginning of the meal.

I do not eat between meals ; except the orange, which is always best eaten by itself, and therefore between meals. I eat slowly, and masticate thoroughly every particle of food. If meat is eaten I take it in moderate quantities ; good beef or mutton, roasted or boiled is best. For every pound of food eaten I taken an hour of exercise.

Now I will tell you how I ate for three days last week :—Breakfast, Sunday morning at 7:30. Took the juice of half a lemon in one-third of a glass of water ; no sugar. At 8 o'clock : nutmeg melon, one-half pound, two batter cakes made of "Warren's Entire Wheat" flour, and sour milk, the weight of which was eight ounces. One cup of coffee with cream, but no sugar.

Dinner at 2 P. M. Roast lamb four ounces, boiled potato two ounces, succotash two ounces, steamed tomatoes two ounces, black bread two ounces.

At 7 P. M. Concord grapes one pound, black bread and butter four ounces. At 10 P. M. half a lemon same as before breakfast.

When I speak of black bread I mean bread made of the whole meal of the wheat kernel, as in the best of "Graham Flour," or of "Warren's Entire Wheat" flour.

And now right here is as good a place as any to speak of wheat. I am quite satisfied this grain is equal in nutritious value to either beef or mutton, and much more compatible with the life of a sedentary person, than animal food. My experience with it dates from my studies with Dr. Graham, who taught hygiene in 1835, '36 and '37 in Boston.

And it is the bread made from the *whole* of the *meal* resulting from this crushed grain that I constantly use and recommend to my patients. The batter cakes that I refer to are always made of this meal.

But here is my diet for Monday. 6:30 A. M., lemon juice as before. 7 A. M., two sour apples uncooked, two batter cakes eight ounces, one baked potato two ounces, one cup of coffee, with cream.

For dinner at 12, noon. Bartlett pears one-half pound, black bread and butter two ounces.

Supper at 7 P. M. Two ears of green corn scraped from the cob before cooking, and mixed with one egg, making two delicious batter cakes, weighing about six ounces ; sliced tomatoes four ounces, with very slight sprinkle of sugar. One-half lemon at 10 P. M.

Wednesday morning, 6:30 A. M., lemon. 7 A. M., breakfast, consisting of "Entire Wheat Flour" "gems" eight ounces, baked potatoes, four ounces, sliced tomatoes eight ounces, one cup of coffee.

Dinner at noon. Bread and butter four ounces, water melon one pound. Pulp of melon not swallowed.

Supper at 7 P. M. Boiled custard three ounces, concord grapes four ounces, black bread and butter two ounces. At 10 P. M. lemon juice.

To some minds this may all seem very childish. But I do not wish merely to please you; I sincerely wish to do you good, and I had rather displease you and tell you truth, than to please you and fail in my effort to influence your life and work.

With good health we can do good work, and work is a blessing to our lives. If love influences our hearts, we will always do honest work. "Love," "Work." Preach sermons to yourselves from those texts, and *live* them. I have no time to display their harmony. I leave them with you for a lifetime.

I wish that I had time to tell you what I know about common salt as an article of diet. But I have no time only to say that I continually see its poisonous effects. It is a great disturber of the physiological processes of the body. It causes numerous grave diseases. It is one of the causes of "Pyorrhoea Alveolaris." In the cure of this disease, salt should be absolutely forbidden. Chloride of soda is found in all natural foods in sufficient quantities, and there is no more need of *adding* it to food than there is of adding carbonate of lime, or phosphate of lime. The use of salt is an unnecessary *habit*.

The use of pepper, spices and alcoholic drinks all have a tendency to irritate and inflame the liver and kidneys, and as a consequence plenty of men suffer for years, and then die at about the age of 55, with "Bright's Disease."

BROKEN GUM TEETH.

'Tis said that very many teeth, mounted on rubber or celluloid, are broken in removing the plate and teeth from the casing by hurrying or carelessness. Dentists often pry their flasks open in a hurry or rap the flask hard with a hammer to loosen the plaster, and by concussion break the teeth opposite the blow. A few have found it out by sad experience, but more prefer to lay the blame on the grade of teeth they may be using than to themselves. Another very easy way that the gums may be broken is in finishing up. How often after taking a set from the flask we find no cracks in the gums, but before, finishing find the gums checked, which is done in holding the plate too tightly in the hands while filing. The rubber being pliable and springy, the gums being solid and thin, will break if they are sprung, the least imaginable. A quick rasp of the file will also do this.—*Dental Student*.

The Rambler, 115 Monroe street, Chicago, Ill., is a fine weekly magazine to place on the centre-table of a dental office. Try it. Your patients and their friends who accompany them, will be entertained by it.

SALT IN INFLAMMATORY DISEASES.

"Give your patients choride of sodium," is the advice of Dr. Goss, of Marietta, Georgia; and he gives the following reasons: "The fact that in severe inflammatory forms of diseases salt disappears from the urine, at once, suggests the necessity of giving salt as a restorative. Salt is certainly serviceable in the reconstruction of the blood and tissues, after great exhaustion following disease, and during the continuance of febrile and inflammatory forms of disease. Mr. Berge, of Belgium, a noted chemist, has shown that common salt is essential to the healthy plasma of blood, and that the fibrin, the albumen, the musculin and the ostein, and all the protein compounds, which take a share in nutrition, becomes solidified, and the red globules of the blood also are dissolved. These globules are decomposed in a solution of pure albumen, whereas, an albuminous water (like the serum of the blood), containing one-hundredth part of chloride of sodium, preserves these globules without material change. In persons whose blood is deficient in saline elements there is a pallid, chorotic, and even albuminuric condition. They have but little, if any, appetite, and the gastric and salivary secretions are greatly diminished.

"In some wounded patients; or those who have undergone surgical operations, if they are fed with unsalted food, the above condition of the blood prevails. Hence, salt is essential to the wounded, as well as to those who are suffering with febrile and inflammatory diseases, and it may be also stated that the blood absorbs oxygen in direct proportion to the amount of chloride of sodium it contains, and that it stimulates also in the same proportion the chemico-vital act of nutrition, and provokes the expulsion through the kidneys, the lungs, and the skin, of the nitrogenized elements of regressive nutrition of the various tissues. If these suggestions relative to the wounded and the sick were practiced, surgical operations would not be fatal in as large a per cent. of instances, nor would as many fever patients die in convalescence by dropsy and debility, resulting from imperfect nutrition. And the above consideration is not the only recommendation to give chloride of sodium to the wounded, and to those who have to submit to surgical operations, but salt should be given as an antiseptic to destroy vibrones and bacteria known to exist in the blood."—*Dental Register*.

EDITORIAL REMARKS.

When practicing medicine, we were often impressed with the value of salt, especially during convalescence from disease. We once had a patient very low from chronic diarrhœa. She had been kept for months on gruel and such like tasteless stuff, till she was nigh starved. After administering neutralizing syrup for a day or two, I asked her what she would have to eat? if she would like any change

in her diet. "Why doctor," said she, "how dare you ask me? I should kill myself with the most indigestible things you can imagine." Well, we asked, "What would it be?" "Why, doctor; I'd give anything for an old fashioned Boston cracker and a dried, salt hering!" "All right," we said, "You shall have them," and they were procured. How she relished them. "Now" said she, "May I have a desert?" "What of?" we asked. "O, I dare not say!" "Speak out," we suggested, "For it is not you that speak, but nature craving for its needs." "Well, then;" she continued, "Bring me a salt pickle." "Bring a whole plate full," we said, as her husband went down into the cellar for them. The very looks of them did her good; and taking one she sucked it, biting off small morcels till she was satisfied. Such a supper proved better than all the medicine I could have prescribed.

"A VISIT TO THE DENTIST."

ED. ITEMS :—Under the above head the October *Independent Practitioner* has a story with a pernicious teaching. The eight-paged tale reduced to a simple statement is that Mr. Jones had a severe tooth-ache one night. After trying various remedies suggested by his wife, he visited a dentist who was foolish enough to try to save the tooth. Returning home it became as bad as ever, when he resolved to visit a higher-priced dentist, who knew his business and had the courage to do it. This man, without hesitation, administered gas and extracted the tooth, saying he could easily put another in its place that would never ache. At his relief from pain, and such a commendation for artificial teeth, Jones blessed the dentist unsparingly, paid his fee ungrudgingly, and resolved such a dentist should ever after be his choice. He would straightway send Mrs. Jones to have all her teeth out that she might have a whole set of teeth that would never ache.

—"This and nothing more."

What can the writer mean? Are we not taught by our experience and by the best teachers of our profession, that the salvation of the natural teeth should be our primary object—extraction our last resort? Yet, here is a really respectable journal giving prominence to the very opposite doctrine—throwing into the back-ground a conscientious dentist who seeks to save a man's tooth, and lauding, as a first-class, "high-priced" dentist, one who easily yields to his patient's whim to have an aching tooth extracted because it can be removed without pain? No wonder "store teeth" are common, and the saving the natural teeth is at a discount.

T. R. TRUST.

ENGLAND TO AMERICA ON COLLEGES.

The following is an editorial from the October number of the British journal of *Dental Science* :

The whole world, and Germany not least, has appreciated and acknowledged its obligation to the dental profession of America, for the progress it has made, and for its successful efforts to promote dental education, and through that to raise what was once a mere craft to an honorable place among the professions. Your dental colleges were for a long time considered the high schools for dentists. And those dentists held a high place in the esteem of the public and among their fellow-practitioners, who, in addition to a university education in their own country, had enjoyed the advantages afforded by an American college. In consequence, many educated dentists have heretofore availed themselves of the opportunities offered by American dental colleges for perfecting their professional education. But at present things are very much changed in this respect. Of late years many persons who have gone to America to obtain diplomas have been either possessed of no education, or were deficient in its most essential parts, who went abroad less for the purpose of storing their minds with the knowledge necessary for professional success than to obtain the D.D.S. in the shortest possible time.

This pernicious practice, which has already greatly injured the reputation of your colleges, if continued, will entirely destroy the confidence of German students in the worth of American dental diplomas. The educated dentist, who might desire to go to America for the purpose of enriching his knowledge and experience at one of your colleges, is deterred by the thought that he must be brought into contact, and placed upon a par, with persons whom he cannot recognize as equals and colleagues.

I believe I have given you a brief and correct statement of the situation. I cannot doubt that your interest in dental colleges is as warm and sincere as my own. Pardon me, therefore, for urging you to give this matter your earnest attention, and to devise some means whereby this deplorable state of affairs shall cease ; so that hereafter only thoroughly qualified students shall be graduated, and that all candidates for graduation who have not gained the approbation of their own State and country, or those who have not obtained at least a preparatory education in one of our universities, shall not be graduated until they have been regular attendants upon the full courses of lectures for several years, and have given positive evidence of fitness to receive a diploma by their ability to pass a severe examination. It is only by such a course, strictly adhered to, that you can regain for your colleges that prestige which they formerly enjoyed in foreign countries.

EDITORIAL REMARKS.

It is humiliating that any practices in our American colleges should give ground for the foregoing complaint. Happily, however, the late formation of the Association of American Colleges will place our dental schools on high ground. By the rules they have adopted, and which we have no doubt they will rigidly carry out, both preliminary education and a thorough collegiate course, will be required of every student. By these means we shall expect the reputation of American graduates to be such that all nations will be pleased to honor.

We are glad to see that European colleges also are coming up to a higher standard of excellence. Even in Germany this is encouragingly true. To the Degree of Doctor conferred by German universities, more especially to the Ph. D., or Doctor of Philosophy, there has attached a certain suspicion, from the fact that some of these institutions have granted the honor to any one who cared to give a few dollars for it. The universities of Germany have at length united to wipe away this reproach. It has been agreed by all the faculties in the empire that neither in law nor medicine, neither in philosophy nor divinity, shall any Doctor's degree be hereafter conferred upon a candidate in absentia; nor is the inaugural dissertation, written in German or Latin, in any case to be dispensed with. The qualifications for the degrees in all the German universities are now practically uniform. In addition to passing the "maturity" examination at a gymnasium, candidates are required to attend a minimum number of classes at a university during three sessions.

THERE is a boy in Putnam county, Tenn., a son of Jefferson Lee, ten years of age, who, owing to the peculiar nature of his skin, has never been known to sweat a drop of perspiration in his life. Another phenomenal feature connected with the boy is that he has only four teeth and he had these when born, having neither cut nor shed any since his birth. He is very much affected by the seasons. In the summer he gets exceedingly warm and is compelled, in order to live at all, to keep his head and body wet with cold water, and falls off to almost a skeleton, but when winter comes and cold weather sets in he is enabled to dispense with his bath and grows fat. He is said to be a sprightly boy, with plenty of sense.

ED. ITEMS:—I was surprised to see the fine appearance of the September number of *ITEMS OF INTEREST*, especially when I looked back to its apparently unpretentious beginning. I owe you an acknowledgment for frequent numbers, at intervals. I like the present form, and especially the "ring" of it. I admire its simple and clear statements. I have no time to waste on indefinite generalities or bunkum. I am, too, for the spelling reform. Please accept my subscription.

G. T. H.

Editorial.

FULL YET EMPTY.

When we say a pint cup is full because it contains water to the brim, we only mean it is full in a relative sense. At any rate, we ought to mean this with reference to any substance. To this fullness of water for instance, may be added many other substances without increasing its bulk; for these particles of oxygen and hydrogen we call water, are not close together, though they appear so. Between each are spaces capable of holding many things without more widely separating their own molecules. Drop in sugar till it is sweet, add crystals of acid till it is sour, make it bitter with aloes, and if you do not add more of each than to fill by their smaller molecules the spaces between the coarser particles of water, you will not increase the volumes. You may do more, for there are substances the particles of which are smaller than of those you have added, and which therefore will fall into the spaces the former things fail to occupy. As, for instance, a whole pint of nitrous oxide gas may be added to this pint of sweetened, soured, imbittered, water and yet there will be only a pint, for the gas stows itself in the spaces left by all the other substances. It is on the principle that a barrel filled full of pumpkins will still hold a large measure full of apples; still you may add an incredible quantity of beans; then you may pour in millet seed till you almost think you are filling an empty barrel; but when you have it full, pressed down and shaken together with the pumpkins, apples, beans and millet you may add a peck of mustard seed; and before you put on the head you can easily add a peck of fine sand. Would you like to still add to your barrel full? You can do so by nearly a bushel. Pour in thirty-two quarts of water, and when this has made it brim full, you can still add a peck of salt. If you would like to add a whole barrel full more of something else to your barrel already so full, just put on the head and seal it up tightly, and then pour in it, through a gimlet hole, as you may very easily, three bushels of oxygen gas. And yet the barrel will not be crowded.

This peculiar quality of being full yet empty is specially applicable to the atmosphere. The air is really a substance, as well as water or rock; and we live in it the same as fishes live in the sea, or animalculi live in the rock. The rock looks to us more really a substance, but its particles are so far apart that the living organisms living in the inter spaces have a world of space around them. "Walking on one particle as its earth, all others are so far distant in its sky, as to be invisible without their telescopes." These particles seem to us immovable but they are really in constant motion. With reference to

one particle, the others are all moving as though surging through a vast space like our stars move in the great expanse around us.

It is erroneous to speak of our atmosphere as an emptiness. There is enough water in it to cover, as by a mighty deluge, the whole earth to the depth of forty feet, if it were precipitated upon it. There is as really a vast ocean above us, as there are waters beneath and round about us. How many millions of tons of water are thus buoyed up is beyond computation. And still water is as constantly and as copiously ascending in the form of vapor as it is descending in the form of rain. How does it get up there? what holds it there? such pails-full, barrelsfull, lakes full. And it seems to go up—a whole ocean of it—just as easily as it comes down. Why does it come down? Because, when the air is full, under certain conditions, it is more than full under other conditions; thus originate the clouds, and then the storms.

And this brings us back to our starting point—full yet empty. The atmosphere may be so full of water that it will take no more, yet so empty, as to many other things as to take prodigious quantities of them. It may be surcharged with water, and yet, as the fiery smoke of a vast flaming forest rises, it as readily drinks it all in as though it were itself an emptiness. Tremendous subterraneous caverns may throw into it through opening earthquakes and vast mouths of volcanoes, vast oceans of gases and cinders, and yet they are received as freely and absorbed as easily as though no water was there; the heat is cherished, the gases digested, and the thousands of tons of ashes and mountains of rock in powder are played with as though but an army of little fairies. They are carried among its currents, tossed about upon its bosom and borne hundreds and thousands of miles in its gorgeous chariots, to be handed back to mother earth as tenderly as the handling of infants. Thus the air is never so full as not to be able to receive more—vastly more—and never so empty that it is not a great sea of waters and of gases and of innumerable inert and living things.

Suppose a quantity of cold air to be confined in a huge bell glass. Raise the temperature to equal a hot summer day. Though it may have been so full of water it would take no more while cold, it will now be found comparatively empty of water though none has departed. If placed over water, the confined, heated atmosphere will absorb a fourth more water, becoming that much heavier, and still be as apparently destitute of all water as before. Our heavy atmosphere is in the clearest day we get, not during foggy, lowerly day, as generally supposed; and the reason such clear days are sometimes known as “weather breeders” is because the atmosphere is then capable of receiving so much water that a chilly current of air passing through it, or a change in its electrical condition, will force it to reject a portion

of its water, first to form vapor—clouds—and then fine vapory particles to become so heavy by conglomeration as to drop as rain. How natural to say that the air is emptying itself of water at such a time. Yet it remains full—empty as compared to the quantity it contained on the bright day, but still full as related to its changed condition.

Says Prof. Williams in *Popular Science Monthly*: “Carefully conducted experiments have demonstrated the general law that atmospheric air is a vacuum to the vapor of water and other similar vapors, while each particular vapor is a plenum [fulness] to itself, though not to other vapors; or, otherwise stated, if a given space, at a given temperature, be filled with air, the quantity of aqueous vapor that it is capable of holding is the same as though this space contained no air at all, nor anything else. But this same space may contain a much smaller quantity of aqueous vapor, and yet be absolutely impenetrable to aqueous vapor, provided its temperature is unaltered. Thus, if a bell-glass filled with air under ordinary pressure, at the temperature of 100° Fahr., be placed over a dish of water at the same temperature, a quantity of vapor, equal to one-thirtieth (in round numbers) of the weight of the air, will rise into the bell-glass, and there remain diffused throughout. If there were less air, or no air at all (temperature remaining the same), the bell-glass would obtain and hold the same quantity of vapor. If, instead of being filled with air, it contained at the outset only this one-thirtieth of aqueous vapor, it would now be an impenetrable plenum, behaving like a solid to aqueous vapor—no more can be forced into it without raising its temperature. But while thus charged with aqueous vapor, there would still be room for vapor of alcohol, turpentine, ether, chloroform, etc. It would be a vacuum to these, though a plenum to itself. On the other hand, if the alcohol, turpentine, ether, or chloroform were allowed to evaporate into the bell-glass, a certain quantity of either of these vapors would presently enter it, and then this vapor would act like a solid mass in resisting the entry of any more of its own kind, while it would be freely pervious to the vapor of water or that of the other liquids.”

But change of temperature is not all that causes water to ascend and rain to fall, or this comparative fulness and emptiness to show themselves. Its electric condition has quite as much to do with it. But when we touch on this subject, we have too much to be treated as a mere paragraph of an article.

Sharp, well-formed instruments are a great saving of strength to the dentist, and of pain to the patient. There is no excuse for having instruments otherwise. In fact, the dentist who is too indifferent to provide himself with the best instruments, and too lazy to keep them in good condition, is generally too shiftless and too unskilful to be depended on in any important operation.

BUSY, YET ACCOMPLISHING NOTHING.

Laboring to exhaustion with lever and fulcrum, and with all the means of science and art, to overturn a mountain, to bring forth—a mouse. Thus are many people trifling life away—busy, yet accomplishing nothing; building a great heap that has absorbed their lifelong energies, to find, on approaching the grave, that it is good for nothing but a bonfire. Such people may be well-meaning—not positively bad—perhaps really of the “goodie” class—but accomplishing nothing worthy of life. They are painstaking and laborious, but build air-castles; they are all on fire with zeal, but beat the air; they make all the ado of a whole army, but fight men of straw—busy, yet accomplishing nothing. They may have talent and education, and even wealth and position, but all are spent in useless schemes, frivolous activities, impractical notions, so that, when time ends, all they have left to show for a life of toil and perplexities is “nothing but leaves”—busy, yet accomplishing nothing.

The good book tells us that, even as Christians, it is not sufficient that we stand on the true foundation; or even that we build on it a house for our habitation. What is the character of our structure? is the question. Will it stand fire? Our motives may be good, our lives faultless, our industry to be commended; but, if we spend our time building foolishly, though we may be finally as a brand plucked from the burning, we shall suffer loss.

“If any man build upon this foundation gold, silver, precious stones, wood, hay, stubble; every man’s work shall be made manifest: for the day shall declare it, because it shall be revealed by fire; and the fire shall try every man’s work of what sort it is. If any man’s work abide which he hath built thereupon, he shall receive a reward. If any man’s work shall be burned, he shall suffer loss: but he himself shall be saved; yet so as by fire.”

Busy, yet accomplishing nothing.

GEOLOGISTS assert that if the continents and the bottom of the ocean were graded to a uniform level, the whole world would be covered with water a mile deep.

TO MAKE a good black varnish for iron or other metals, dissolve by heat three ounces of asphaltum, four quarts of boiled oil and eight ounces of burnt umber. Mix the compound with turpentine while cooling.

THE ORGAN of hearing is not always located in the head. In the clam it is found at the base of the foot; some grasshoppers have it in the forelegs, and in many insets it is on the wing. Lobsters and crabs have the auditory sacs at the base of the antennæ.

DIGNITY.

We once saw a nice-looking man make a fool of himself. He looked like a gentleman and professed to be a christian. Just because he was in the midst of only men, and because he thought the pleasure of an evening's social gathering could not be complete without some one giving amusement, he played the fool. He actually threw off the cloak of the christian gentleman he generally wore, and even the dress of decency, and made of himself a vulgar buffoon. Why is it some men must consider it sport to say loose, coarse things because only men are present? Why is it they must fall into dirty water because a woman is not near to keep them up? It is astonishing some men who lay claim to considerable respectability will at such times let the devil use them as his clowns, till not only others present are ashamed of them (though they may laugh), but till they are ashamed of themselves, as soon as they shut the banquet door behind them. And this all for fun! Perhaps their real inner lives are not above such low pleasures; if so, the dress they generally wear deceives us.

At an after-supper general conversation and interchange of sentiment, a time since, we were disgusted with one of these scenes. There seemed to be no call for it either, for all present appeared to be gentlemen. But "out of respect" for the one who thought he must play the court buffoon, one, and then another, and then another, joined in an apparent interest of his double meaning jokes and vulgar insinuations, till he was encouraged to still greater coarseness, and half of the party were laughing as though they enjoyed it, and all the more because some were driven away by it. The idea that a man of decency must look around to see if any ladies are about or might be in hearing, before he says what he thinks will be funny!

And then, as such men come out where their neighbors can see them, they throw the stub of their cigar into the spittoon, try to wipe their mouths from its filth, and come forth as complacently as though they were still gentlemen. They would not have what they have said repeated outside for anything; decent society would be made to blush, and the friends they think the most of would turn from them in disgust. Why can't such men, and those who laugh at them, be ashamed of such things beforehand, and avoid such things, as well as realize afterward that they had degraded themselves?

Rubber cement is made by dissolving pure raw rubber in bisulphite of carbon. Benzine or turpentine will do, but not so well. In using the carbon great care must be taken not to allow it to come near fire, It explodes easily.

PHONETICS.

In September *Items* we gave a specimen of phonetic spelling; that is, representing each sound of a word by a single letter, thus avoiding all indefinite and superfluous letters. It is strange to see with what different views such an effort is received. While some are pleased others are disgusted. Some look on it as a utopian scheme, or at best as a novelty that it is well to study and experiment with, but not practical; while others think it is just what is needed; *BUT*—and they make this but so big that everything beyond it is hidden. Others—and these are the learned class—would gladly adopt a simpler and more consistent mode of spelling, if it did not destroy the time-honored association of words. “We now know,” say they, “their origin by their peculiar spelling.”

Well, these are formidable hindrances—very formidable. But are they not the old barricades behind which only ignorance or prejudice have taken refuge for hundreds of years? Is it possible we cannot clear these away, and allow orthography to march on with the other sciences in grand triumph to consistency, harmony and beauty? Must these weak and foolish excuses, so unworthy the intelligence, the spirit and the ambition of the nineteenth century, prevent all betterment in the combinations of the characters with which we present our words to the eye? It is like persistently clothing a beautiful child in the old swaddling clothes of infancy; or it is like taking a wild child of the forest and, though succeeding in training, cultivating and developing that child till it becomes comely, beautiful and promising, yet continuing to clothe it in the scant, grotesque and outlandish habiliments of its wild state. We do this very thing with our literature. While we have improved it in every other feature till it has become the pride of the whole people, we persist in making no betterment in its clothing, the characters with which we present it to the eye. Our present orthography is but the crude, primitive and unsightly rags of a by-gone age. Phonetics is the dignified, comely and appropriate garment with which literature should be clothed.

DR. SELTZER, in the Boston *Medical and Surgical Journal*, recommends beef tea, made very hot with red pepper, for delerium tremens. A London surgeon is stated to have treated 150 cases successfully with this remedy alone.

PROFESSOR FISHER, of Munich, has succeeded in obtaining from distilled coal a white crystalline substance, which, as far as regards its action on the system, is exactly the same as quinine, though it assimilates with the stomach more easily than quinine does.

ANTI-NATAL INFLUENCES.

That the intellectual, moral, and physical character of parents influences their offspring is beyond doubt. We all look for the general traits of the parents in their children. We do not expect a specially bright child as the progeny of a parent of stolidity, and low, coarse propensities. We are surprised to see the offspring of a consumptive healthy and long lived; and it is almost an anomaly to have the children of the debauchee and the habitual drunkard without the taint of these vices. To produce good stock in other animals we look for favorable traits in the sire and the dam. In the human specie how little we consider these things!

Anti-natal influences go still farther. The passions of the heart, the predominences of the mind, and the prevailing influences of the spirits make their impressions on the child. How important that parents are impressed with the responsibility of being what they would have their children to become!

Still farther. What the child is depends also on what the mother is during gestation. The very disposition—of tranquility and amiability, or irritability and sordid passions; of intellectual activities and refining surroundings and associations, or grossness and sensuous indulgences; of kindness, love and benevolence, or sordid selfishness, wanton cruelty and perverse hatefulness—will tell powerfully on the character of the progeny.

If all this be true, how shall we doubt the evidences of physical impressions so frequently presented, which we call marks. How can we refuse to admit them when cause and effect are so closely related in such cases? Yet there are more skeptics on this subject among physicians than among the laity, and more among men who are only observers than among women, who must have the most intimate knowledge of the subject.

ALL engineers know what a nuisance a steam or frost-covered window is in cold weather. A very thin coat of glycerine applied on both sides of the glass will prevent any moisture forming thereon, and will stay until it collects so much dust that it cannot be seen through; for this reason it should be put on very thin. Surveyors can use it on their instruments in foggy weather, and there is no film to obstruct the sight. In fact, it can be used anywhere to prevent moisture from forming on anything. It does not injure the usefulness of field glasses, etc.; in fact, a small drop of pure glycerine in a small hole in a sheet of brass makes a good lens for a small microscope.

WHAT IS THE OUTLOOK?

Good, very good. Most children grow so slowly that it is noticed only when we have been away from them a while; but "*Our Profession*" grows so fast we have to grow ourselves to keep up with the promising youth. And now, through the action of the dental colleges (though perhaps because goaded on by the criticisms of their derelictions, and yet let us never mind the how), the dental profession makes another grand step forward. At all times the dental colleges have grown as fast as the profession, and yet we are continually expecting them to grow faster. They are evidently now bound to keep ahead. Let us be stimulated to advance also, studying to be approved in our own qualifications, and sending forward to them for graduation young men who shall be an honor to us and to them.

Complaints now come principally from the strong ones, who have grown so fast as to get ahead of both colleges and the mass of the profession. Perhaps we can hardly call it complaints either, for the sound is more the cry of leaders calling back, "Come on! Come on!"

We are coming; all are coming, and the colleges are not lagging behind.

Cash Payments.—One of the most interesting and useful mottos you can hang on your office wall, and live up to in your practice, is—*Payment is expected as soon as work is completed.* It is better to have it there on the first day your office door is opened. If timidity has prevented it till you have allowed accounts to run for months, it will be the more difficult to begin to exact payment as soon as work is done; and yet, "it is better late than never." The more you trust the more you will have to trust, till prompt payments will be the exception to your general custom. Your whole business will become a drag, and you will have no spirit left to do good work.

You will sometimes feel like saying it is as much work, and more disagreeable, to collect your bills than to do the work. Then, again, if your customers do not pay you promptly, you cannot pay others promptly, and while you are dunning your customers others are dunning you. Away with all trust. Put your foot down. Do less work and have the cash for what you do. The better part of the community will respect you for such a course. You will drive off the more worthless class, but those who are able to have good work done, and are willing to pay for it, will take their places. Of course, there must be some exceptions. The worthy poor must be served, especially to relieve distress; but even in these cases, better give them half their bill for prompt payment. Have it understood you keep no accounts.

NEUTRALIZING SYRUP for summer complaints, diarrhœa, dysentery, cholera morbus, cholera infantum, sour stomach, etc. The following is so efficient that every head of a family should have it in the house. It is some trouble to make it, but the amount here indicated, will last so long, and do so much good, that when once made, its trouble and expense will never be regretted. When a physician, we found it the best remedy for the purposes mentioned of anything else we used.

Bruise thoroughly (but not to a powder) 1 lb. good rhubarb. Mix this with 1 pound bicarbonate soda (common baking soda) and 2 quarts clean, coarse, wet sand, and fine pebbles. Now make a percolator by knocking three or four holes in the bottom of a three quart tin pail, or some other tall, slender vessel, and after putting in some clean, coarse gravel around the holes, put in the mixture and percolate by pouring on water at intervals till the strength of the rhubarb is extracted. It should take two or three days; the last third of the droppings, which will be quite weak, should be boiled down to about the strength of the first. Now sweeten with enough white sugar to make a palatable syrup, and add enough of the following to make it decidedly carminative: 1 part tincture peppermint; 2 parts tincture anise.

Dose—For adult, 1 tablespoonful; for a child, 1 teaspoonful; for an infant, less in proportion to age. Repeat every fifteen or thirty minutes till pain ceases and there is a change in the condition of the bowels. It should act as a mild cathartic, though often relief will come before this effect is reached.

“THE German public can have but one opinion in regard to the integrity of American dental colleges, when it sees, again and again, men returning from America, after a five-month’s absence, as Doctors of Dental Surgery, who, previous to that time had been known to them as ordinary workmen, holding in some instances very menial positions.”

Not quite so bad, gentlemen. It is bad enough for America to have one dental college of the above character; but it has no more. And be it known that this scurrilous misnomer for a dental school is a small affair, sending out but few “graduates.” Its roll of “diplomas,” as we understand, it is obliged to keep as a part of its record, is quite limited. Two or three other colleges heretofore have granted diplomas “on merit” after one course of lectures, but even this is now discontinued, and now it looks as though this Wisconsin college will soon be a thing of the past.

Miscellaneous.

TO MAKE KOUMISS.

Koumiss is considered a good restorative, and is undoubtedly a help to digestion. It can be made by any one. The following directions for making it are from the *Weekly Medical Review*:

Fill a quart or champagne bottle up to the neck with pure milk; add two tablespoonfuls of white sugar, after dissolving the same in a little water over a hot fire; add also a quarter of a two cent cake of compressed yeast. Then tie the cork on the bottle securely, and shake the mixture well; place it in a room of the temperature of 50 deg. to 95 deg. Fahrenheit for six hours, and finally in the ice box over night. Drink in such quantities as the stomach may require. It will be well to observe several important injunctions in preparing the koumiss, and they are: To be sure that the milk is pure; that the bottle is sound; that the yeast is fresh; to open the mixture in the morning with great care on account of its effervescent properties; not to drink it at all if there is any curdle or thickening part resembling cheese, as this indicates that the fermentation has been prolonged beyond the proper time. Make it as you need to use it. The virtue of koumiss is that it refreshes and stimulates, with no after reaction from its effects. It is often almost impossible to obtain good fresh koumiss, especially away from large towns. The above makes it possible for any physician to prescribe it.

GRINDING MATERIALS.

The finest of emery cuts and leaves minute scores in the metal, particularly if the metal be soft; it is impossible to produce a good, polishable surface on silver with flour of emery; burnishing would be necessary to make a surface, and even then it would present a striated appearance under reflected light. Other grinding substances are required for some fine surfacing work. Moulding sand that has been used in the foundry for some time makes an excellent material for surfacing light brass—brass that contains a large proportion of zinc. Some excellent results are gained by the levigation of the sand—rubbing it under a muller on a stone (marble) slab, as paints are ground for the artist. By this means the foundry sand may be reduced to an impalpable powder, which, however, retains much of its abrading quality.

There is a manufacturer of fine tools in an Eastern city who uses coal ashes to give the last surface, before polishing, to his hardened steel tools. He takes the ashes of Lehigh coal, pours them into a tub of water, stirs them up violently, and when the water is turbid with

the fine ashes held in suspension, he draws it off into a shallow tank and allows it to settle. The sediment is his polishing powder. If a higher degree of fineness is required, the operation of stirring and washing, and settling is repeated. The material thus obtained makes an excellent surfacing material. The moulding sand is much improved in this way.

In the manufacture of silver ware (solid silver) the surfacing before burnishing is done by a blue clay, technically called "grit." It is found in several localities, particularly in the Connecticut river valley up to fifty miles from its mouth, in the vicinity of Middletown and Hartford. This clay appears to be the substance of which blue slate is formed, but is usually obtained in a semi-liquid form, and is dried for use. It is not surface clay, being found below the alluvium, and sometimes below gravel, its depth or thickness of bed having been discovered, by boring for artesian wells, to be in some places more than sixty feet. Its identity with slate substance appears to be suggested by its behavior under heat, it assuming a stratified, porous form. It does not scratch pure silver, nor copper, nor mar coin gold, but it will not give a polish. It grinds without leaving a shining surface; this is produced by burnishing, or rubbing with whiting, chalk, or even with the bare hand.—*Scientific American*.

THE USE of mullein as a palliative for the cough of phthisis seems to be meeting with favor in various quarters. The customary form of administration has been a decoction of the plant in milk. More recently, the smoking of the leaves has been recommended as a more agreeable and effective mode of administration.—*Boston Medical and Surgical Journal*.

Gold Solder.—Dr. J. J. R. Patrick says that an easy flowing and a stronger solder can be made without the admixture of the baser metals. Jewelers or goldsmiths who seldom use a higher quality of gold than 16-carat, never use the baser metals in the composition of their solders, excepting when pin brass or spelter forms a portion of the alloy in the composition of the lower grades of gold they may be working, the spelter or pin brass in combination with fine silver is used in making the solder, in the place of fine copper. Dentists, however, who have no use for gold of a lower quality than 20-carat, can very well use a fine quality of solder that will flow as easily under the action of the blowpipe as the solders made from lower qualities of gold. All gold solders that are to be used on gold above 16-carat fine should be made *from the gold that is to be soldered*, and according to the following formula: Gold 89 parts, silver 7 parts, copper 4 parts. *There is no solder made that will relieve the manipulation from the effectual use and application of the blowpipe.*

GUTTA-PERCHA.

Gutta-percha is not elastic, like india rubber. When below or at the average temperature of the air it is hard as wood, and very tough; at a higher temperature it becomes as soft as beeswax, and may be molded into any form. The heat of boiling water is sufficient to soften it. In this condition it may be cut and united again into one piece without the appearance of a joint. Gutta means gum, and percha is an island from which it comes, so that the name of the substance amounts to the gum of Percha. Botanists have named the tree from which gutta-percha exudes *Isonandra gutta*; it is a tree growing in Malacca, Borneo, Singapore, Java, and the adjacent countries. The gum was at first obtained by felling the trees and collecting the exuding juice, either in vessels or in shallow pits dug in the soil, or in baskets made of leaves the juice being left to harden under the action of the sun. More recently the trees are pared and the juice obtained from deep cuts made in them the same as with the rubber trees. The lumps of solid gum thus obtained are united by softening in hot water and by pressure. The raw gutta-percha of commerce is a dry, red, or marbled mass, not unlike leather cuttings which have been pressed together. When perfectly pure it is nearly white, its ordinary brown color being due to organic coloring matter. The gum is of a mixture of several rosins. Previously to being used, gutta-percha is cleansed from dirt by kneading in warm water, being then usually rolled into thick plates and sheets. Thus purified it has a chocolate-brown color—is not transparent unless first reduced to sheets as thin as paper, when it is about as transparent as horn. At the ordinary temperature of the air the gum, as we have said, is tough, stiff—not elastic or ductile. By the aid of heat it can be rolled into sheets, drawn into wire, and kneaded into a uniform mass with india rubber. Gutta-percha is insoluble in water, alcohol, dilute acids and alkalies, which properties, with those before given, make the gum the useful and valuable substance it is. It can be dissolved in warm temperature, sulphide of carbon, chloroform, coal-tar oil, and in a few other oils. Dry gutta-percha is a very good insulating material for electricity. It is employed for belts for machinery instead of leather, tubes for conveying water, pumps, buckets, surgical instruments, ornamental objects of many kinds, for covering telegraph wires, making ocean telegraph cables, etc. Gutta-percha is molded into tubes by the aid of machinery similar to that employed for making lead and block-tin tubing. Many objects are made from it by pressing the gum, while soft, into wooden or metal molds—*Rural Sun*.